be discrete while others are not. Additionally, channel "discreteness" may be a temporary phenomenon driven, for example, by fluctuating pressures.

[0108] The structured surface is a microstructured surface that defines discrete flow channels with each channel having a minimum aspect ratio (length/hydraulic radius) of 10:1, in some embodiments exceeding approximately 100:1, and in other embodiments at least about 1000:1. At the top end, the aspect ratio could be indefinitely high but generally would be less than about 1,000,000:1. The hydraulic radius of a channel is no greater than about 300 micrometers. In many embodiments, it can be less than 100 micrometers, and may be less than 10 micrometers. Although smaller is generally better for many applications (and the hydraulic radius could be submicron in size), the hydraulic radius typically would not be less than 1 micrometers for most embodiments. As more fully described below, channels defined within these parameters can provide efficient bulk liquid transport through an active fluid transport device.

[0109] The structured surface can also be provided with a very low profile. Thus, active fluid transport devices are contemplated where the structured polymeric layer has a thickness of less than 5000 micrometers, and possibly less than 1500 micrometers. To do this, the channels may be defined by peaks that have a height of approximately 5 to 1200 micrometers and that have a peak distance of about 10 to 2000 micrometers.

[0110] Microstructured surfaces in accordance with the present invention provide flow systems in which the volume of the system is highly distributed. That is, the liquid volume that passes through such flow systems is distributed over a large area. Microstructure channel density from about 10 per lineal cm and up to about 1,000 per lineal cm (measured across the channels) provide for high liquid transport rates. Generally, when a manifold such as shown in **FIG. 3***a* is employed, each individual channel has an aspect ratio that is at least 400 percent greater, and more preferably is at least 900 percent greater than a manifold that is disposed at the channel inlets and outlets. This significant increase in aspect ratio distributes the potential's effect to contribute to the noted benefits of the invention.

[0111] Suitable liquid channels for use in the present invention may be of any suitable geometry but are generally rectangular (typically having depths of 50 to 3000 micron and widths of 50 to 3000 micron or "V" channel patterns (typically having depths of about 50 to 3000 micron and heights of 50 to 3000 micron) with an included angle of generally 20 to 120 degrees and preferably about 45 degrees. The presently preferred structure has a nested construction wherein the master channels are 200 micron deep and repeat every 225 microns with three equally spaced channels in the base, each 40 microns deep. Compound channels are also possible and often preferably such as rectangular channels that contain smaller rectangular or "V" channels within.

[0112] One preferred embodiment of a fluid transport film of the present invention is illustrated in **FIG. 2***i* as alternate fluid control film **138**. The film **138** has wide channels **139** defined between peaks **140**. A plurality of smaller peaks **141** are located between side walls **142** of the peaks **140**. The smaller peaks **141** thus define secondary channels **143** therebetween. The smaller peaks **141** are not as high as the peaks **140** and, as illustrated, create a first wide channel **139** including smaller channels **143** distributed therein.

[0113] Preferably, the center-to-center distance between peaks **140** is about 9 mils., and the center-to-center distance between peaks **141** is about 1.9 mils (the center-to-center distance between adjacent peaks **140** and **141** is about 2.6 mils). The walls of the peaks taper at an about 11E taper. Each peak is plateaued at its upper top with a lateral width of about 1 mil. At its base, the peak **140** has a width of about 2.5 mils., and at its base, the smaller peak **141** has a width of about 1.3 mils. The height of the peaks **140** is about 7.8 mils., while the height of the peaks **141** is about 1.6 mils. A body layer or backing layer **144** supports the peaks **140** and **141** and is made of the same material simultaneously via an extrusion process. The film **138** of **FIG. 2***i* is formed from Tenite polyethylene 18BOA (available from Eastman Chemical Corporation, Kingsport, Tenn.) with 1% TRITON™ X-35 non-ironic surfactant. A second body layer **145** is bonded (e.g., by coextrusion) to the bottom side of the backing layer **144**. The second body layer **145** is preferably formed from PE Eastman Tenite polyethylene 18BOA only (with no surfactant). Preferably, the nominal overall height of the fluid control film **138** is 11 mils, with the depth of the backing layer **144** being approximately being 1 mil., and the depth of the second layer **145** being approximately 2 mil. In an alternative embodiment, the total caliper (height) of the fluid control film **138** of **FIG. 2***i* is 15 mil., with the additional height being provided by forming the peaks **140** to be taller. In addition, the fluid control film may include a tie layer on a bottom side thereof.

[0114] As mentioned previously, suitable fluid control film components of the present invention may be made through a process such as extrusion, injection molding, embossing, hot stamping, etc. In embossing, a substrate (e.g., a thermoplastic material) is deformed or molded. This process is usually performed at an elevated temperature and perhaps under pressure. The substrate or material is preferably made to replicate or approximately replicate the surface structure of a master tool. Since this process produces relatively small structures and is sometimes repeated many times over the process is referred to as microreplication. Suitable processes for microreplication are described in U.S. Pat. No. 5,514, 120.

[0115] In one embodiment, the present invention relates to fluid control systems that incorporate fluid control film (e.g., microreplicated wicks) to move liquid from one area and transfer it to another, e.g., by capillary action. The presence of the fluid control film allows for a subfloor that can rapidly handle (e.g., absorb) large amounts of liquid from spills, leaks, and condensate, thus preventing corrosion of support beams caused by undesirable liquids. Specifically, the liquid control film component of the present invention serves to move liquid (such as spills) in food preparation or airline galley areas away from such areas in order to prevent corrosion (or, e.g., to move lavatory fluids in an airplane lavatory area to a collector in order to prevent corrosion).

[0116] Exemplary fluid transport systems of this invention are described herein and illustrate certain features of the present invention. In one preferred active fluid transfer embodiment the system comprises: a fluid control film; an adhesive; a substrate for attachment thereto, a cap layer; a vacuum or potential source; and a liquid collection means. In one preferred passive fluid transfer embodiment the system comprises: a fluid control film; an adhesive; and a substrate for attachment thereto. The components of these